Image processing techniques to cope color vision deficiency in detecting pork adulteration in meatballs visually

ABSTRACT

The aim of this study is to utilize image processing techniques for solving color vision deficiency problem in visual detection of colors. Besides, about 0.5% female and 8% male were affected by color vision deficiency. Nevertheless, pork cheating in beef and chicken meatballs was investigated by the changing in color of pork's DNA containing samples into a remarkable color. The visual results were supported by absorption spectroscopy device to avoid color vision deficiency problems. Surly, any pork component is prohibited in Halal and Kosher food and many non-Muslim countries are interested in Halal food as it reduces the risk of zoonotic diseases as well as having unique quality attributes economically. Utilizing spectroscopy device is inappropriate way to support the visual decision compared to image processing techniques. The key feature in this study is the pixel color intensity. The colors were enhanced by adjusting their brightness and saturation levels. Matlab was used to measure and classify the pixels of images. The image size was 320×240 pixels; which provides 76,800 pixels to be averaged, measured and classified. Moreover, a graphical user interface was designed to make the algorithm to be simply used by even unprofessional users. The results of this study indicated that the applied method is less complicated, more than $8,000 cost saving and it detected the Halal and non-Halal samples as the previous study did. Thus, it can be a good alternative to the utilizing of spectroscopy device.

Keyword: Color vision deficiency; Halal food; Image processing; Pork detection